EVALUATION OF REBUILDING THE STURGEON POPULATION IN THE SNAKE RIVER (LGD TO HCD). 8605001

SHORT DESCRIPTION:
Determine the effects of Lower Granite and Hells Canyon dams on the white sturgeon population and identify potential mitigative actions needed to protect and restore the effected white sturgeon population to levels that can sustain a subsistence harvest.

SPONSOR/CONTRACTOR: N/A
Nez Perce Tribe
Nancy J. Hoefs, Field Research Biologist
Department Fisheries Resources Management P.O. Box 365, Lapwai, ID 83540
208/843-7320

SUB-CONTRACTORS:
N/A

GOALS

GENERAL:
Supports a healthy Columbia basin, Maintains biological diversity, Maintains genetic integrity, Increases run sizes or populations, Adaptive management (research or M&E)

RESIDENT FISH:
Research, M&E

NPPC PROGRAM MEASURE:
10.4A.4

RELATION TO MEASURE:
This study addresses measure 10.4A.4 that calls for the Bonneville Power Administration (BPA) to "..fund an evaluation (including a biological risk assessment, see Section 7.3B.1) of potential means of rebuilding the sturgeon population in the Snake River between Lower Granite and Hells Canyon dams".

OTHER PLANNING DOCUMENTS:
N/A

TARGET STOCK	LIFE STAGE	MGMT CODE (see below)
White Sturgeon	Spawning adult	N/A
White Sturgeon	Adult	N/A
White Sturgeon	Juvenile	N/A
White Sturgeon	Young-of-the-year	N/A
White Sturgeon	Larval	N/A
White Sturgeon	Egg incubation	N/A

BACKGROUND

STREAM AREA AFFECTED

Stream name:
Snake River

Stream miles affected:
approximately 140

Hydro project mitigated:
The project mitigates for effects of Hells Canyon and Lower Granite dams and those downstream that have altered sturgeon spawning and rearing habitat and

LAND AREA INFORMATION

Subbasin:
Snake River

Land ownership:
mixed

Acres affected:
see river miles

restricted migration of white sturgeon and their primary food sources.

HISTORY:

The Nez Perce White Sturgeon Project (8605000) was initiated in FY95 to address measure 10.4A.4 as a sub-contract of the broader Columbia Basin Sturgeon Project (8605000) coordinated by Oregon Department of Fish and Wildlife. In FY95 and FY96, a biological risk assessment was conducted and completed that 1) synthesized potential mitigation actions designed to restore the white sturgeon population in the Snake River between Hells Canyon and Lower Granite dams, 2) assessed risks and uncertainties associated with implementation of these mitigation actions, and 3) identified critical ecological information concerning the current status, health and attributes of the population and their habitat that is needed before the effects of potential mitigation actions can be evaluated. In FY97, the Nez Perce White Sturgeon Project (8605001), under direct contact to BPA, developed and implemented research strategies and a multi-year research program designed to obtain the needed ecological information identified by the biological risk assessment.

BIOLOGICAL RESULTS ACHIEVED:

In FY95 and FY96, a biological risk assessment to evaluate potential management and research strategies for white sturgeon between Hells Canyon and Lower Granite dams was conducted and completed. The 'Upper Snake River White Sturgeon Biological Risk Assessment' identified potential management actions and critical information about Snake River white sturgeon and their habitat that is needed before the effects of potential management actions can be assessed. In FY97, studies designed to obtain needed information were initiated and information concerning the current status, health, and attributes of the white sturgeon population between Hells Canyon and Lower Granite dams were collected.

PROJECT REPORTS AND PAPERS:

Quarterly/Progress Project Reports--Statler, D. 1995. Evaluate effects of Mitigative Measures on Productivity of White Sturgeon (BPA Project Number 86-50). Quarterly Report #95-1 (July1-September 30). Nez Perce Department of Fisheries Resource Management. Lapwai ID.

Osborne, R.S. 1995. Evaluate effects of Mitigative Measures on Productivity on White Sturgeon (BPA project Number 86-50). Quarterly Report #95-2 (October 1- December 31). Nez Perce Department of Fisheries and Resource Management. Lapwai ID.

Osborne, R.S. 1996. Evaluate effect of Mitigative Measures on Productivity of White Sturgeon (BPA Project Number 86-50). Quarterly Report #96-1 (January 1-March 31). Nez Perce Department of Fisheries and Resource Management. Lapwai, ID.

Annual Project Reports--Hoefs, N.J. 1997. Evaluate Effects of Mitigative measures on productivity of white sturgeon populations in the Columbia River downstream form McNary Dam and Determine status and Habitat requirements of White Sturgeon Populations in the Columbia and Snake Rivers Upstream from McNary Dam. (BPA Project Number 86-50). Draft Annual Report FY96. DRMF Nez Perce Tribe. Lapwai, ID.

Biological Risk Assessment--Mobrand Biometrics Inc. 1996. Upper Snake River White Sturgeon Biological Risk Assessment. Draft Report. Prepared for Nez Perce Tribe. DFRM. Lapwai ,ID.

ADAPTIVE MANAGEMENT IMPLICATIONS:

The primary goal of this project is to restore and protect the white sturgeon population between Hells Canyon and Lower Granite dams. This sturgeon population has been severely impacted by alterations to habitat, food resources and migratory corridors. In FY95 and FY96, mitigative/management actions, associated uncertainties and a broad array of information needs were identified by the biological risk assessment process. In FY97, a multi-year research plan and study design were formulated and implemented to begin the collection of data identified in FY96. This information will not only provide a base for which potential mitigative actions can be evaluated, but also will address some of the uncertainties associated with the potential mitigation actions. Thus, information on the Snake River sturgeon population will assist in determining which mitigation actions may be more appropriate and successful in restoring the Snake River sturgeon population and other sturgeon populations in the Columbia River system.

PURPOSE AND METHODS

SPECIFIC MEASUREABLE OBJECTIVES:

The primary objective of the Nez Perce White Sturgeon Project is to evaluate the need and identify potential measures for protecting and rebuilding the white sturgeon population between Hells Canyon and Lower Granite dams to levels consistent with a sustainable subsistence harvest. Specific objectives of the project are to 1) complete a biological risk assessment that identifies

potential mitigative actions and associated uncertainties and informational needs to assess the effects potential actions on restoring the sturgeon population, 2) formulate a multi-year plan of study to obtain critical ecological information identified as needed by the biological risk assessment, 3) initiate data collection studies, and 4) based on this information, make mitigation recommendations and devise a plan to evaluate the effects of potential mitigative action(s) on the sturgeon population. In FY95 and FY96, the biological risk assessment was completed and, accordingly, in FY97 a multi-year study plan was designed and collection of information concerning current status, health and attributes of the white sturgeon population was initiated. Specific objectives for FY98 are to continue the population assessment study initiated in FY97 in order to 1) refine estimates of abundance of white sturgeon throughout the river reach, 2) further assess population attributes, such as sex and age composition, and begin to 3) determine age specific growth rates and 4) movement of specific life stages throughout the Snake River system. In addition, based on information obtained from FY97 pilot studies assessing the ability to monitor sturgeon movements to identify habitat selection in Hells Canyon in FY98, a study to determine 1) spawning location and timing and 2) movements and rearing patterns of young-of-the-year, juvenile and adult sturgeon is proposed.

CRITICAL UNCERTAINTIES:

A biological risk assessment process is an integral part of this project. It is inherent in this process to identify potential adverse effects (risks) to habitats/populations, and to contain those risks. Although the biological risk assessment completed for this project targeted white sturgeon, identifiable risk to other resident/anadromous fish populations and habitat were also identified. Risk and critical uncertainties associated with implementation of the various potential mitigative actions that have been identified to restore the sturgeon papulation in the Snake River between Hells Canyon and Lower Granite dams are reported in the 'Upper Snake River White Sturgeon Biological Risk Assessment'.

BIOLOGICAL NEED:

The white sturgeon is native to the study area and is classified by the State of Idaho as a species of special concern. Development of the Columbia River Basin hydroelectric system has created impoundments throughout the basin, altering sturgeon spawning and rearing habitat and severely restricting the movement of white sturgeon and their principle food resources, eulachon and lamprey. As a result, white sturgeon in the Snake River between Hells Canyon and Lower Granite dams are not as abundant as they once were. Due to depressed population levels, the Idaho Department of Fish and Game has set a "preservation" management focus for Snake River white sturgeon. Recreational fishing in the area has been catch-and-release only since 1970 and the traditional Nez Perce Tribe subsistence harvest of white sturgeon on the Snake River has been severely limited.

HYPOTHESIS TO BE TESTED:

The null hypothesis being tested is that changes that have occurred in the status, health and attributes of the Snake River sturgeon population between Hells Canyon and Lower Granite dams since the completion of these dams has not been due to the dams and associated environmental changes. The alternative hypotheses are that there has been a 1) negative (declining population) change in the Snake River sturgeon population, or, 2) a positive (increasing population) change as a result of the damming the Snake River system.

ALTERNATIVE APPROACHES:

N/A

JUSTIFICATION FOR PLANNING:

N/A

METHODS:

To rebuild the Snake River sturgeon population between Hells Canyon and Lower Granite dams, three steps will be taken. First, a biological risk assessment process will be used to identify potential mitigative actions, the risks and uncertainties identified with their implementation, and the critical data needed for the evaluation of their effects on sturgeon restoration. Second, in response to identified data needs a multi-year study plan will be developed and implemented. Third, based on ecological data, a recommendation concerning an appropriate mitigative approach and plan for evaluation of the effects on sturgeon restoration will be formulated.

1) The Biological Risk Assessment (FY95-FY96)--- In general, specific information concerning the sturgeon population between Hells Canyon and Lower Granite dams is limited. The Ecosystem Diagnosis and Treatment process (EFT; Lestelle et al. 1996) relying on knowledge of regional experts will be used to identify life history and environmental relationships that would otherwise not be available. Through a series of workshops the EDT process will be used to identify 1) a set of potential mitigative

or management actions to restore the Snake River sturgeon population, 2) the associated risks or uncertainties associated with their implementation, and 3) information that is currently lacking that is needed to assess the applicability of the actions and assess their effects on the Snake River sturgeon population.
2) Data Collection (FY97-FY01)--- In response to data needs identified by the biological risk assessment, a multi-year study plan will be formulated and implemented to determine the current status, health and attributes of the Snake River sturgeon population. Proposed objectives are to a) estimate abundance of age classes of white sturgeon throughout the reach, b) assess population attributes (e.g., determine age-specific growth rates and sex ratios), c) identify spawning locations and timing, and d) determine movement and rearing patterns of young-of-the-year, juvenile, and adult sturgeon. Sampling for sturgeon has traditionally been done using hook-and-line, with unknown biases. We are proposing to use a combination of hook-and-line and diver-nets to capture fish. Fish captured will be aged, sexed, weighted, measured and tagged prior to release. Recaptured marked fish will be used to estimate total numbers and begin to understand habitat use and movement patterns. To identify spawning locations and timing and movement and rearing patterns of young-of-the-year, juvenile and adult sturgeon we will monitor radio marked and sonic tagged fish. Specifics of study designs (e.g., sampling schedules, determination of bias, statistical methods and analyses) will be presented in multi-year research plan (FY97).
3) The Final Report (FY01)---The final report (along with annual reports) will present ecological findings concerning status, health, and attributes of the Snake River sturgeon population in addition to recommendations concerning alternative mitigative approaches. Monitoring and evaluation plans designed to assess the effects of mitigative action(s) will also be included.

PLANNED ACTIVITIES

SCHEDULE:

Planning Phase **Start** FY95 **End** FY97 **Subcontractor**

Task 1. Conduct biological risk assessment that identifies a) potential mitigative actions, b) the associated risks of implementation, and c) critical data needs for the assessment of effect on restoring sturgeon populations.
2. Design multi-year study plans designed to collect critical data identified by biological risk assessment.

Implementation Phase **Start** FY97 **End** FY01 **Subcontractor**

Task 1. Implementation of studies designed to collect data concerning status, health, and attributes of the Snake River sturgeon population needed to evaluate effects of potential mitigation actions.
2. Complete final report that includes a) current status, health, and attributes of the Snake River white sturgeon population between Hells Canyon and Lower Granite dams, b) recommendations concerning applicability of mitigative actions identified by biological risk assessment process, and c) evaluation/monitoring plan to assess effects of implementation of mitigative action(s) on restoring the Snake River sturgeon population.

PROJECT COMPLETION DATE:

Completion of data collection phase and recommendation of mitigation action FY01. However, further study is expected for evaluation of the effects of potential mitigative actions on sturgeon populations.

CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:

N/A-- Do not expect a need for major schedule or budget changes.

OUTCOMES, MONITORING AND EVALUATION

SUMMARY OF EXPECTED OUTCOMES

Expected performance of target population or quality change in land area affected:

The Biological Risk Assessment (FY95-FY96) will identify 1) potential mitigative actions and their associated uncertainties in restoring the sturgeon populations, and 2) information needs to determine the appropriate mitigative approach and to evaluate effects on the white sturgeon population. Data concerning health, status and attributes of the white sturgeon population between Hells Canyon and Lower Granite dams will be collected (FY97-FY01) in response to needs identified by the biological risk assessment. This information will be used (FY01) to 1) assess risks and uncertainties associated with mitigative actions designed to restore sturgeon population levels, and identify what and how potential mitigation actions should be implemented, and 2) provide baseline data that can be compared to information collected after alternative mitigative actions are implemented.

Present utilization and convservation potential of target population or area:
Traditionally, white sturgeon were part of the subsistence harvest of the Nez Perce Tribe. Subsistence harvest, however, has been severely limited as a result of depressed population levels.

Assumed historic status of utilization and conservation potential:
Traditionally, white sturgeon were part of the subsistence harvest of the Nez Perce Tribe.

Long term expected utilization and conservation potential for target population or habitat:
The long term goal of the Nez Perce Tribe is to rebuild the ecological health and status of the white sturgeon population to a level that will sustain subsistence harvest.

Contribution toward long-term goal:
Ecological data collected concerning current status, health, and attributes of the sturgeon population will contribute to the long term goal of the tribe by 1) addressing uncertainties associated with potential mitigative actions, thus indicating what mitigative actions may more appropriate or successful in restoring the Snake River sturgeon population between Hells Canyon and Lower Granite dams, and 2) act as a baseline to gauge effects of alternative mitigation actions on the white sturgeon population.

Indirect biological or environmental changes:
No direct or indirect biological or ecological changes are expected to occur as a result of the collection of data concerning the current health, status, and attributes of the white sturgeon population. However, indirect effects of potential mitigative actions may vary widely. Indirect effects on various biological and environmental components of the Snake River system (including other fish and fisheries; economics, recreational, and scientific use; and regional societal and cultural values) are identified in the Upper Snake River White Sturgeon Biological Risk Assessment.

Physical products:
Specific physical products (e.g. number of fish tagged) of data collection phase of the study will be presented in multi-year study plan (FY97) developed in response to needs identified by the biological risk assessment.

Environmental attributes affected by the project:
N/A- There will be no direct or indirect effect on environmental attributes as a result of data collection.

Changes assumed or expected for affected environmental attributes:
Although, no near-term change to the sturgeon population is expected as a result of data collection, information collected will be used to determine what long-term mitigation actions are appropriate to restore sturgeon populations in the Snake River to sustainable subsistence harvest levels.

Measure of attribute changes:
N/A- No change in number of fish is expected as a result of data collection.

Assessment of effects on project outcomes of critical uncertainty:
Uncertainties associated with potential mitigative actions will be assessed by collecting key data based on predictions of each potential action.

Information products:
Information products include 1) the 'Upper Snake River White Sturgeon Biological Risk Assessment' (FY95-FY96), 2) annual reports (FY97-FY01) presenting information concerning current status, health, and attributes of the Snake River white sturgeon population, and 3) a final report (FY01) that presents recommendations concerning mitigative approaches designed to restore the sturgeon population and includes a monitoring/evaluation plan to assess the effects of alternative actions on the sturgeon population.

Coordination outcomes:
N/A

MONITORING APPROACH
N/A-- The monitoring approach to assess the effects of alternative mitigative actions on the sturgeon population between Hells Canyon and Lower Granite dam will depend on the specific mitigative actions implemented. The appropriateness of each of the potential mitigation actions for implementation will be based on the analysis of the ecological information being collected (FY98-FY01). In general, we will use an approach based on evaluating alternative actions - Adaptive Resource Management. The specific monitoring approach designed to evaluate the effect of mitigative actions will be formulated along with recommendations on actions in the final report from the data collection phase of this project.

Provisions to monitor population status or habitat quality:
N/A

Data analysis and evaluation:
N/A

Information feed back to management decisions:
N/A

Critical uncertainties affecting project's outcomes:
N/A

EVALUATION
A biological risk assessment has been completed and represents a consensus of the views of various regional fisheries biologist with knowledge of white sturgeon and the Snake River System.

Incorporating new information regarding uncertainties:
In general, information concerning Snake River white sturgeon between Hells Canyon and Lower Granite dams in limited or lacking. As a result, decisions concerning mitigation needs to restore white sturgeon populations will be based on proposed data collections made in FY97 - FY01.

Increasing public awareness of F&W activities:
N/A

RELATIONSHIPS

RELATED BPA PROJECT	RELATIONSHIP
8605000 Evaluation of sturgeon in the Columbia River System in areas downstream from Lower Granite Dam	In FY95 and FY96, the Nez Perce Sturgeon Project was a subcontract of 8905000 administered by ODFW.

OPPORTUNITIES FOR COOPERATION:
N/A

COSTS AND FTE

FUTURE FUNDING NEEDS: **PAST OBLIGATIONS (incl. 1997 if done):**

FY	$ NEED	% PLAN	% IMPLEMENT	% O AND M
1998	$375,000	10%	90%	
1999	$400,000	10%	90%	
2000	$400,000	10%	90%	
2001	$400,000	25%	75%	
2002	$400,000	10%	90%	

OTHER NON-FINANCIAL SUPPORTERS:
In FY97, two full-time and three part-time biological aid positions were supported by the Nez Perce Tribe to help collect sturgeon data. Project funds will need to cover the costs of these positions after FY97.

LONGER TERM COSTS:
Costs (300-400K/year) of evaluating effects of implemented mitigation will the costs of these positions after FY97. Costs (300-400K/year) of evaluating effects of implemented mitigation will begin in FY01 and extend beyond FY02.
Expected annual costs will be for implementation and evaluation of mitigative action(s).

1997 OVERHEAD PERCENT: Overhead of 29.5 % is included in budget projections.

HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:
Overhead costs apply to all project costs with the exception of equipment (exceeding $2000) and subcontracts.

CONTRACTOR FTE:
Currently four FTE are being supported (Project Leader, Research Biologist, Field Crew Supervisor, and a Biological Technician)

SUBCONTRACTOR FTE: N/A

SUPPLEMENTAL RESIDENT FISH EVALUATION FACTORS:
This project provides direct benefits to anadromous and other non-target fish populations. The assessment of potential mitigative actions to rebuild the Snake River sturgeon population between Hells Canyon and Lower Granite dams will include the impacts of regulated flows from Hells Canyon Dam on the life history requirements of white sturgeon. Flow analyses will include adequacy for white sturgeon spawning and egg/larvae development. White sturgeon are spring spawners. Reduced flow fluctuations from Hells Canyon Dam may also benefit spawning and rearing habitat of anadromous and other non target fish, for example, Snake River sockeye and spring/summer chinook, which are federally listed as endangered species. This project is not applicable to the biological/integrated rule curve. All 'reasonable' precautions have been taken,